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## THE IMPACT OF TECHNOLOGY ON COMMUNICATIONS

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Most parts of Australia are at least 19,000 kilometres from Western Europe, the source of most of her people, equipment, institutions and ideas. Its coastline stretches over 19,000 kilometres and encloses almost as much land as the U.S.A. Communication, therefore, was seen as the lifeblood of a distant colony, alleviating the sense of exile and excommunication, and ultimately has had a crucial influence on Australia's development.

In the first days of colony, letters bound Australia to Britain, carrying social, economic, political and scientific information. No post office existed in Sydney for the first twenty-one years of the colony's life, and mail was handled through ad hoc private arrangements which were subject to widespread abuses. In 1821, New South Wales passed legislation to regulate the postage of mail, in 1828 the office of Postmaster was created for Parramatta, Campbelltown, Liverpool, Penrith, Windsor, Bathurst and Newcastle, thus reflecting the spread of settlement in the colony. The real pacesetter, however, was Tasmania, which in 1828 appointed a Committee of Inquiry into postal reform and, four years later, established a postal service as a government department with the other colonies quickly following suit.

By 1850 New South Wales, Victoria, Queensland, Western Australia, South Australia and Tasmania were extremely urbanised with most of the population living in cities, towns or villages. The gold rushes of the 1850s placed great strains on mail services resulting from the influx of people. Within each colony, the creation of post offices followed the movement of the population. These post offices were staffed, usually on a part-time basis, by men and women drawn from all walks of life and all sectors of the community.

In the mid-19th century a semaphore system was the fastest known means of communication, although this optical telegraph had several drawbacks. It was labour-intensive, totally ineffective at night, and rain, fog, mist and snow dimmed its power. The 1850s, however, saw the advent of electric telegraphy which transformed the business of communication in Australia by adding the crucial element of speed. In 1853 Samuel McGowan brought morse to Australia and the 1860s saw the spread of the telegraph throughout Australia.

By 1869 a distinct pattern had emerged in Australia with telegraph lines concentrated around capital cities and market towns, goldfields and denser pastoral and agricultural settlements. Smaller country towns were channelled into arteries that bridged capital cities. All lines were

government-owned and administered in each colony by a department of electric telegraph which was joined to other State responsibilities and departments.

The effect of the new technology was seen in communication itself. For example, newspapers carried information transmitted by telegraph. The telegraph also presented intelligence from neighbouring colonies, news of movements of shipping, the price of goods, and reports from Parliament. The business community rapidly became the pivotal point for the demand for telegraph services as city and country-town offices became commissioning points for orders and centres of market and banking intelligence. The telegraph can also be seen as an important element of central government in the large colonies as a medium for issuing instructions and orders and announcing appointments.

South Australia actively sought to attract support for a link to the telegraph line which stretched overland from England to India. Sturt's journey through the Northern Territory provided the route and in 1872 the continent was spanned by the line which led to the development of Alice Springs and Darwin as repeater stations and provided further bases for exploration of the continent. In 1872, the telegraph cable from Europe and Asia was ultimately linked to the southern cities.

Overseas cable had an immense impact on the Australian colonies. Through fast communication, it generated economic development in the colonies and was a pervasive agent of social change. The overseas cable connection spurred foreign investment in the 1880s and was central to the growth of the business community. By the end of the century, the colonies dovetailed more closely with Britain economically, while at the same time trade connections with Asia were enlarged. The telegraph became a tool of business and commerce and the foundation of a new information society in Australia.

Development of telephones paralleled the growth of the telegraph system. Telephones were a technology that played a prominent and enhancing role in the lives of women, who immediately entered the workforce of telephony. This trend began with the move of employing postmistresses in country towns and extended gradually to telegraphy. The pattern set in the United States of America was transferred, although with some cultural resistance, to Australia, continuing the trend of opening avenues of employment for women established through the mechanisation of factories. The progress made by women in telegraphy and telephony - both skilled operations requiring training and examinations and endowed with status traditionally beyond the reach of women - marked a striking departure in colonial industrial practice and a notable union between women and new communications technologies.

In 1901 the Constitution empowered the Commonwealth Government to take over, control and administer Posts and Telegraph Departments of each State of the new Commonwealth and 1 March 1901 saw the establishment of the Postmaster-General's Department (PMG) from the former separate and distinctive colonial departments thus creating a national monopoly.

The development of the new Marconi Radio System saw the Department seek absolute control of the new communications system and in 1905 a short Wireless Telegraphy Act, giving the Department control, was passed.

Telecommunications growth was interrupted by World War I although technological advance was stimulated. The outbreak of War caused the rapid growth of wireless stations around the Australian coastline and, by the end of World War I, technological developments saw new prospects for telegraphy and telephony emerging overseas. The 1920s saw the implementation of automatic exchanges and the then Secretary of the Postmaster-General's Department, Mr H. P. Brown, instigated many strategic planning decisions that modernised Australia's telecommunications systems; for example, the systematic extension of automatic exchanges and the development of long-line interstate trunk services.

In March 1922 agreements for wireless telephony to commence were signed and Hughes became the first Australian Prime Minister to make a political broadcast with a speech made at Bendigo and transmitted to an outside audience.

In 1923 it was decided that broadcasting stations would be permitted to forward programs on definite wavelengths to people with 'sealed sets' locked on to one wavelength. Broadcasting began officially on 23 November 1923. However, people wished to listen to any service and the advent of crystal radios helped beat the monopoly of 'sealed sets'. Revised regulations were issued under the Wireless Telegraphy Act in July 1924. A dual system of Class A stations (funded by listeners' license fees) and Class B (other) stations was developed and formed the basis for Australian wireless and television broadcasting. A system also developed whereby any person holding a license could operate any type of receiving equipment for an annual fee. In mid-1928 the concept of a national broadcasting service developed. July 1932 saw the advent of the Australian Broadcasting Commission (ABC) whereby a Government - backed broadcasting system integrated the technical functions of the PMG with the evolution of the ABC.

Australia's overseas telephone system came into being despite economic problems, and technological progress continued. Gradually Australia-wide telephone links were developed and 1934 saw the development of the first overseas airmail service. Telephones helped the development of the Royal Flying Doctor Service which was further stimulated by the growth of the pedal wireless.

World War II has been called the telecommunications war with radar, telephony and telegraph all playing an important role. Increasingly, defence needs shaped telecommunications usage and the War opened up a new creativity in PMG's telecommunications technology from a dependence on carrier technology to Australian designed systems.

From the post-war years, and especially during the 1950s, telecommunications services offered many new developments - automatic telephony and telegraphy, television, electronic computers, microwave radio, rocketry and transistors.

Increasingly, telecommunications equipment was manufactured locally and progressive automation continued.

The Overseas Telecommunications Commission (OTC) was established and Parliament was broadcast for the first time in 1946. In 1953 legislative authority was given to the establishment of both national and commercial television stations. The first commercial television broadcast was from TCN 9 in Sydney on 16 September 1956. The 1956 Olympic Games in Melbourne gave impetus to all forms of telecommunications in Australia.

Television reached all Australian capital cities, except Darwin by 1962 and spread outwards to the countryside. Planning commenced for a dual national and commercial system with all the attendant installation of equipment and towers. Radio engineering and research continued as a major area of PMG work, and the ABC began broadcasting on shortwave bands as well as overseas through Radio Australia.

In April 1965 INTELSAT I provided satellite telecommunications services between North America, Britain and Europe. INTELSAT II, launched in October 1966, linked in Australia. The OTC earth station at Carnarvon in Western Australia was linked into the American space program and in 1968 OTC opened a new earth station at Moree that provided a link for integrated data, telephone, telegram, telex and television circuits which effectively linked Australia to the rest of the world.

In 1964 PMG had entered the transmission business using telephone lines to transmit computerised information between stock exchanges and some business houses. In 1969 PMG's

'Datel Service' became the first common user data network using transmission over an ordinary switched telephone network or over privately leased lines. Eventually, a Royal Commission into the Post Office in April 1974 recommended the creation of an independent body solely responsible for telecommunications and, on 1 July 1975, the Australian Telecommunications Commission (Telecom) came into operation.

From the 1960s on, however, PMG had, like other authorities overseas, turned toward the possibility of enlarging and diversifying land-based telecommunications systems through domestic satellite technology. By the late 1960s pilot studies on NASA equipment had demonstrated the feasibility of a geostationary satellite linked with an Australian network, which in addition offered the possibility of taking telephone connections to remote and inhospitable regions.

In 1972 a Special Task Force was established to investigate the possibilities of satellite usage. The Telecom National Satellite Communications System Study was released in November 1977 and suggested that in terms of technical feasibility the proposal should go ahead, though not on economic grounds. In August 1977, as a result of a private report, a political case was mounted on the grounds that television services to areas not currently served could not be provided through the existing communications network, which was neither satisfactory, nor capable of providing such a service to the Australian people. Also in November 1977, a Commonwealth Government Task Force proposed the introduction of a domestic satellite system. The then Minister for Communications, the Hon. A. A. Staley and the Prime Minister, the Rt. Hon. Malcolm Fraser, actively supported the Task Force Report.

In 1981 the Government formed a company (AUSSAT) to own and operate Australia's National Satellite System; shares in the company are jointly held by the Commonwealth Government and Telecom. In 1985 AUSSAT had two satellites launched and they are now fully operational. The domestic satellite system will ultimately complement, diversify and add resilience to existing ground-based communications systems. Significantly it will enable communications throughout the country - from the largest cities to the most isolated areas.

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